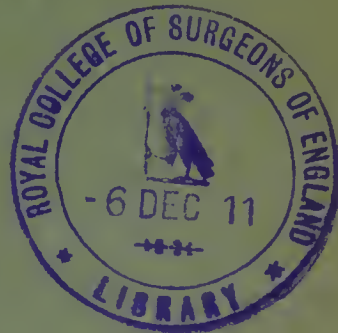


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THE OCCURRENCE OF INFANTILE PARALYSIS IN THE UNITED STATES AND CANADA IN 1910 *

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The great prevalence of infantile paralysis in the United States in 1910 and its rapid increase in the last two or three years in this country, are matters which demand our serious consideration, and in the following paper will be presented the data obtainable on the subject, preceded by a brief résumé of the history of the disease in this country insofar as it bears on the present situation.

That infantile paralysis is not a new disease is a matter of common information, and it is of interest to note that the first probable allusion to it to be found in literature occurs in the book of Samuel, fourth chapter and fourth verse. It is as follows:

"And Jonathan, Saul's son, had a son that was lame in his feet. He was five years old when the tidings came of Saul and Jonathan out of Jezreel, and his nurse took him up and it came to pass as she made haste to flee that he fell and became lame. And his name was Mephibosheth."

This short clinical history, although suggestive, is hardly convincing, but it is quite as likely to have been a case of infantile paralysis as are some of the cases reported as such in the year 1910.

The disease is first recorded as occurring in America in epidemic form in 1841 by Colmer,¹ as follows:

"While on a visit to this parish, West Feliciana, Louisiana, in the fall of 1841, my attention was called to a child, 1 year old, slowly recovering from a hemiplegia. The parents, who were people of intelligence and unquestioned veracity, stated that either eight or ten cases of either hemiplegia or paraplegia had occurred during the preceding three or four months within a few miles of their home. Some of these recovered completely, others were improving. The little sufferers were all under 2 years of age and the cause seemed to be the same in all, viz., teething."

The account of this epidemic has, however, been questioned on the ground that it was only hearsay evidence and not substantiated, and the first authentic description of an epidemic of thirteen cases is credited to Bergenholz, a Swede, in 1881.

*Presented by invitation before the American Pediatric Society, Lake Mohonk, N. Y., June 1, 1911.

1. Am. Jour. Med. Sc., 1845, v, 248.

That infantile paralysis has existed in the United States for an indefinite time is perfectly familiar to us from the fact that we all know of adults affected whose history would reach back fifty years.

In 1875, Sinkler² reported that in the preceding four years he had seen eighty-six cases at the Infirmary for Nervous Diseases in Philadelphia.

The best evidence that I can find of the existence of infantile paralysis in our midst in any considerable degree for the last twenty-five years is derived from a study of the records of two hospitals, one in Boston and one in New York, which also contribute the best evidence that I have seen of the sudden increase of the disease in our midst in the last few years. The first named of these hospitals draws from a

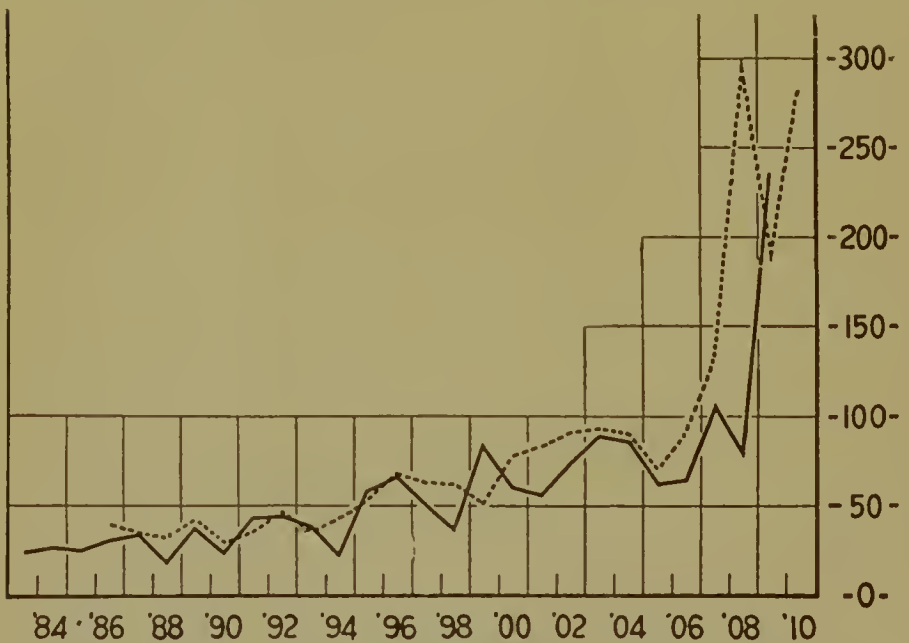


Chart 1.—Number of new patients with infantile paralysis treated at Children's Hospital, Boston, indicated by the solid black line; those treated at the New York Orthopedic Dispensary and Hospital by the dotted line; both by years.

large area and the clientele of both in the last twenty-five years has been more or less constant.

The accompanying chart (Chart 1) is constructed in part from the records of the orthopedic out-patient department of the Children's Hospital, Boston, and shows the number of new patients with infantile paralysis applying for treatment since 1883 in that department. The figures show that in 1883 we treated twenty-two patients, and that the number of cases with unimportant fluctuations rose steadily for twenty-five years,

2. Sinkler: Boston Med. and Surg. Jour., Nov. 23, 1893.

until 1909, when Boston was an epidemic center, when it rose suddenly to 235 cases.

The second institution analyzed on the chart is the New York Orthopedic Hospital and Dispensary, the figures of which were kindly furnished to me by Dr. Russell A. Hibbs, and which show in general the same facts. There were thirty-nine new cases in 1886, rising gradually to 1907, when a marked increase occurred. It will be noted that the New York increase began two years before that in Boston.

The first outbreak in the United States of the disease in any considerable degree was in 1894, when Caverly³ of Rutland described an epidemic of 132 cases in the Otto Creek Valley, Vermont. In this epidemic Caverly attended to abortive cases, not under that name but as cases presenting the clinical symptoms without the paralysis.

In the same year was reported by Brackett⁴ a group of ten cases in North Adams, Massachusetts. Both Rutland and North Adams are in railroad communication with Boston, and it is interesting to note that Putnam⁵ in November of the previous year, 1893, had called attention to the increased prevalence of the disease in Boston in the preceding summer, the patients coming from different parts of the suburbs of Boston.

In the following eleven years, that is, from 1894 up to 1904, there were reported in the United States nine small epidemics (Chart 2), the second largest again in Massachusetts, consisting of thirty-eight cases,⁶ and the largest, fifty-five cases,⁷ in California, about San Francisco. The total epidemic cases reported in these eleven years, i. e., from 1894 to 1904, inclusive, in the United States were 157, or an average of about fifteen a year.

In 1905-6 no epidemics were reported.

In 1907 the most extensive epidemic ever known visited New York City and its surroundings and was estimated at 2,500 cases. In the same year were reported epidemics in Virginia (26 cases), Pennsylvania (100 cases), Massachusetts (234 cases), Michigan (20 cases), and Northern New York (29 cases); a total of about 2,900 cases.

In the year 1908 the disease was apparently quiescent, groups of cases being reported from Massachusetts (136), Michigan (30), Florida (16), Minnesota (60) and Wisconsin (60); a total of 302 cases.

In the year 1909 large epidemics occurred in Massachusetts, Minnesota, Kansas, Nebraska and Cuba, the total number of cases being 2,343.

3. Jour. Am. Med. Assn., 1896, xxvi, 1.

4. Brackett: Tr. Am. Orthop. Assn., xi, 132.

5. Putnam: Boston Med. and Surg. Jour., Nov. 23, 1893.

6. Painter: Boston Med. and Surg. Jour., cxlvii, 633.

7. Wood's Occidental Med. Jour., xvii, 77.

When we come to the analysis of the figures for 1910 we must remember that they were brought out by a systematic and extended inquiry undertaken by the Massachusetts State Board of Health, and probably had such an inquiry been possible in one of the earlier years a larger number of cases would have been discovered than now stand as reported in those years. Still, one cannot conceal the fact that in 1910 there apparently occurred a very much larger number of cases than before all over the United States, and that the extent and distribution of the disease in this country in 1910 was of a different character from that of any previous year.

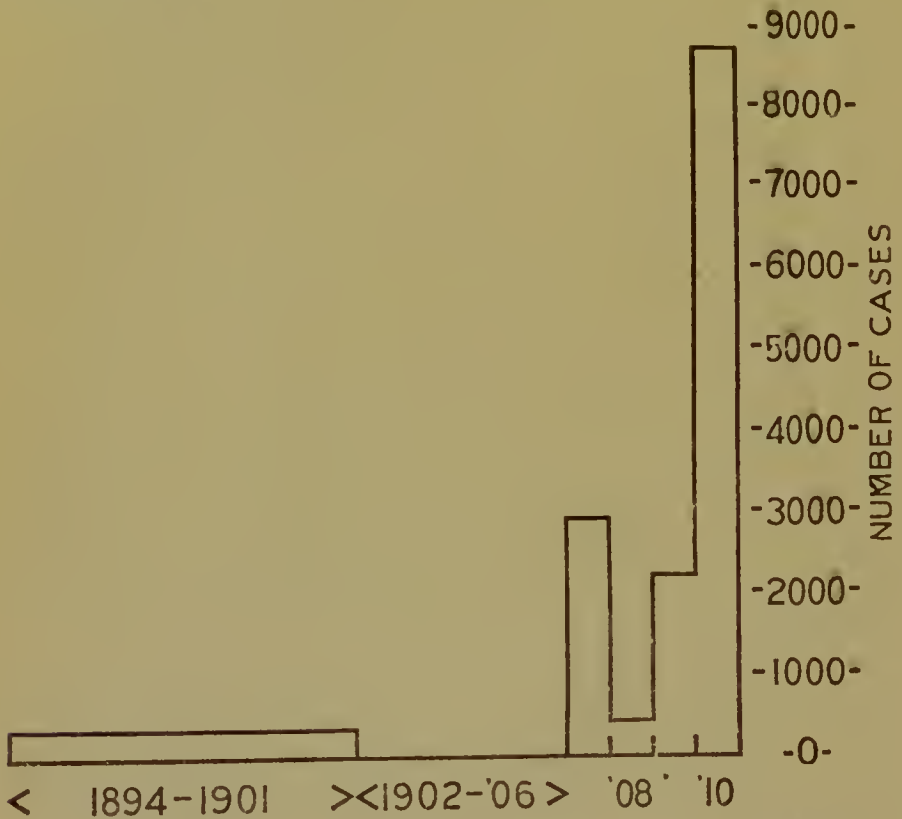


Chart 2.—Prevalence of infantile paralysis in the United States, 1894 to 1910.

There were about 8,500 cases reported in the United States in 1910, and if we contrast that figure with the years prior to 1904 when the average yearly number was fifteen cases per year we may appreciate what an enormous increase has occurred.

To summarize for a moment our facts so far collected: The disease has unquestionably existed in this country for many years. In 1893 the first reported tendency to increase is said to have showed itself in Boston, followed by the Vermont epidemic in 1894, and in the next eleven years by other small epidemics in various parts of the country.

Then came a period of quiescence followed by a violent outbreak in New York in 1907, since which, on the whole the extension of the disease has been rapid and in all directions. We are evidently now facing conditions favorable to the spread of the disease which did not exist in former years, and conditions which do not exist in Europe now, and it is for the purpose of bringing out this very point that I have thus dwelt on the earlier history of the disease in this country.

In Europe, although there has been an undoubted tendency of the disease to spread since 1905, when the great Scandinavian epidemic occurred, five-sevenths of 8,000 cases reported from all over the world for the five years ending in 1909 occurred in this country. The rela-

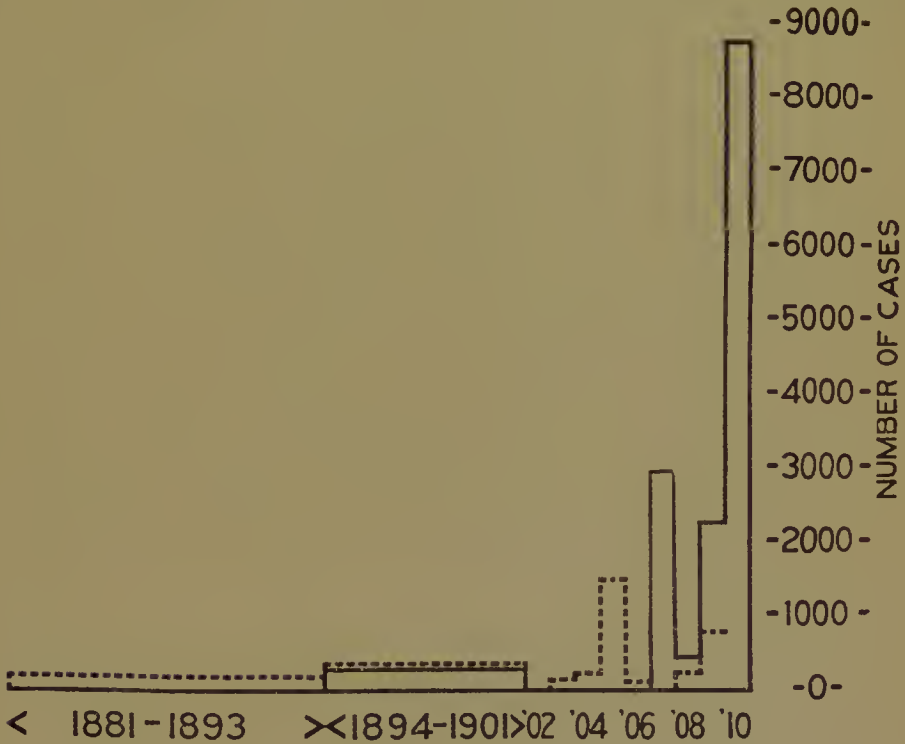
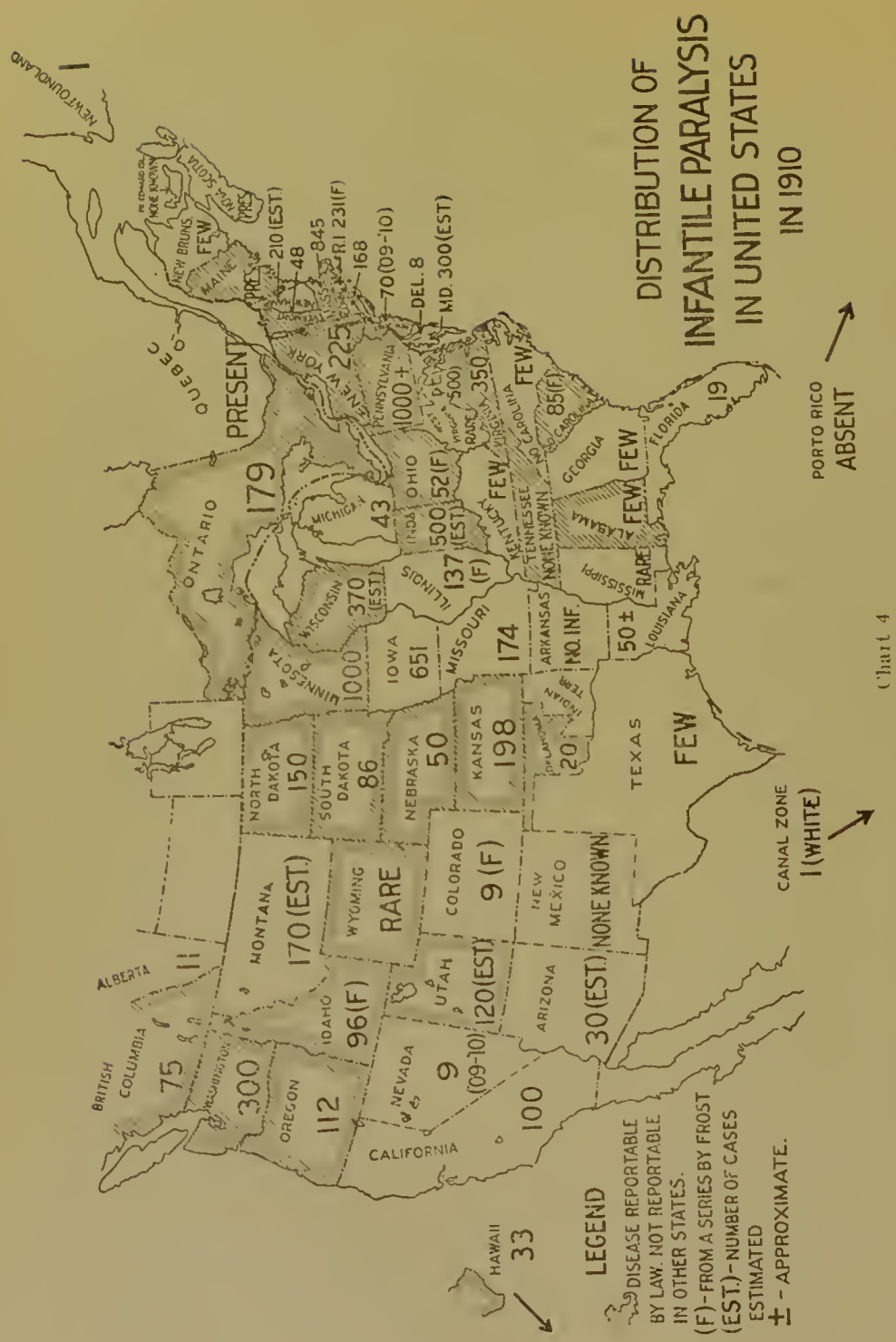


Chart 3.—Relative prevalence of infantile paralysis in the United States and Europe and Australia; the solid black line refers to the United States; the dotted line to the following countries: Italy, Sweden, Norway, Germany, Austria, France, England and Australia.

tive prevalence of the disease on the two continents is shown in the chart (Chart 3) and needs no comment. The disease is a reportable one in Sweden, Norway, Germany and Austria, so that in these countries, in any event, epidemics are not likely to fail to be reported.

The data with regard to the disease in the United States in 1910 were collected as follows: Dr. M. W. Richardson, the secretary of the Massachusetts State Board of Health, sent out several hundred letters of inquiry to state boards of health, to officers of state medical societies



and to prominent physicians in various parts of this country, its dependencies, and Canada. From their replies to those letters the data given in Table 1 have been compiled. In a few instances the figures have been taken from the Marine Hospital Service tables prepared by Frost, and such are marked (F). In certain instances where no reliable number of cases or no number at all was given in a state, and the number of deaths from infantile paralysis during 1910 was given, the number of deaths has been multiplied by ten, a conservative mortality per cent., and the number of probable cases thus estimated. In such cases the figures have been followed by the abbreviation (Est.).

TABLE 1.—DISTRIBUTION OF INFANTILE PARALYSIS IN THE UNITED STATES, 1910

Alabama*	Few	North Carolina.....	Few
Arizona	30 Est.	North Dakota*.....	150
Arkansas	No information	Ohio*	52 F.
California	100	Oklahoma*	20
Colorado	9 F.	Oregon*	112
Connecticut	163	Pennsylvania*	1000+
Delaware	8	South Carolina*.....	85 F.
District of Columbia.	500	Rhode Island.....	231 F.
Florida	19	South Dakota*.....	86
Georgia	Few	Tennessee*	None known
Idaho*	96 F.	Texas	Few
Illinois	137 F.	Utah*	120 Est.
Indiana*	500 Est.	Vermont*	48
Iowa	651	Virginia*	350
Kansas*	193	Washington*	300
Kentucky	Few	West Virginia.....	Rare
Louisiana	50 Approx.	Wisconsin*	370 Est.
Maine*	Present	Wyoming*	Rare
Maryland	300 Est.		
Massachusetts*	845	Hawaii*	33
Michigan	43	Porto Rico.....	Absent
Minnesota*	1000	Alberta	11
Mississippi	Rare	Canal Zone.....	1 White
Missouri	174	Philippines.....	None
Montana	170 Est.	Newfoundland	1
Nebraska*	50	Nova Scotia.....	Present
Nevada	9 (1909-10)	Ontario*	179
New Hampshire.....	210 Est.	Prince Edward Islands	None known
New Jersey*.....	70 (1909-10)	Quebec	Present
New Mexico.....	None known	British Columbia*...	75
New York*.....	225	New Brunswick.....	Few

*Disease reportable by law. (In states not starred disease is not reportable by law.)

Est.—No of cases estimated.

F.—From series by Frost.

Approx.—Approximate.

Mortality per cents. have not been allowed any importance in this tabulation, as they are only of value or significance in instances in which an epidemic has been carefully enough studied to bring out the total number of cases occurring. For example, one state in which the disease is not reportable, reports thirty-five cases and thirty deaths, which probably does not mean that the mortality was enormously high in that state, but that the deaths were reported and the non-fatal cases were not.

Although somewhat lower than the figures in foreign countries, there is reason to believe that the Massachusetts figures of 8 per cent. are approximately correct for that state at least, although the mortality per cent. in the District of Columbia in 1910 was only about 3 per cent.⁸

The map of the United States (Chart 4), on which has been marked the number of cases in each state for 1910, shows a total of about 8,700 cases, not counting Canada or such dependencies as Hawaii, and making no account of states reporting "a few," etc. In practically all cases not otherwise designated, the number of cases given is the number officially given out. Various terms have been used in the cases of states from which exact information was not obtainable, the term being chosen according to the information which was sent in.

The disease is now reportable by law in twenty-three states, which are shown shaded on the map, and various other states have the matter under consideration or may have legislated very recently.

A study of this map shows in the first place a wide-spread and general distribution of the disease with, in general, a focal occurrence and radiation from these foci. There is in general a scarcity of cases in the southeastern section of the country. In the New England states there occurred a group of cases, the largest number being in Massachusetts and Rhode Island. It is probable that the large number credited to Massachusetts is in a measure due to the careful investigation of the disease carried on there now for four years, as a result of which the medical profession is on the alert to report cases, so that the apparent prevalence there is probably exaggerated in comparison with other states.

An epidemic focus of considerable size existed in Pennsylvania, Maryland, North Carolina and Virginia, the latter state being the southern limit of any considerable extension in the East.

In the Middle West there was a large epidemic focus in Minnesota, Wisconsin and Iowa, some 2,000 cases being reported from these states, and in a circle around these three seriously infected states there existed in neighboring states from fifty to 200 cases per state, with over 500 cases in Indiana. An area of comparative immunity from north to south covered the Rocky Mountain region, but on the Pacific Coast there existed in Washington an epidemic center of 300 cases, with extension south to California and general involvement of the Southwestern states.

In Canada the disease appeared most extensively in the Province of Ontario, with 179 cases, with seventy-five in British Columbia and eleven in Alberta. New Brunswick reported a few cases, but no deaths, and there were cases in Quebec and Nova Scotia, with one in Newfoundland, but Prince Edward Island reported the disease as unknown there in 1910.

8. Washington Med. Ann., May., 1911.

The disease is reportable by law in Ontario and British Columbia and not in the other provinces.

As to our Southern dependencies, there were no cases in Porto Rico or the Philippines; one in a white laborer in the Canal Zone, and an epidemic of thirty-three cases in Hawaii.

It is disquieting to note that in April of this year (1911) an epidemic of twenty or more cases occurred in Louisiana,⁹ which was so threatening that the governor was appealed to for aid in suppressing the epidemic. In Massachusetts in the four years during which the disease has been under observation it has occurred earlier each year, reaching its height in September in 1907, August and September in 1908, in August in 1909 and in July in 1910. It will be of importance to note whether this is a mere coincidence or whether the disease is really tending to occur earlier as it spreads.

Such are the data that it has been possible to bring to light, but it is of course evident that the number of cases thus officially reported is a poor criterion by which to judge the total number that have occurred. In half of the states the disease is not reportable and it is naturally impossible to obtain any reliable information from these, and where it is reportable many cases are either unrecognized or unreported when recognized. The disease is so dreaded by the public that there will be a tendency to the suppression of information, especially in summer resorts.

In view of these facts, it may seem to this society worth while to take action to urge again on all state boards of health the importance of placing this disease on the list of those reportable by law. Several states in which the disease is not now reportable have the matter under consideration and the situation is too serious not to warrant every effort to place the disease where it may be studied and watched.

Several state boards have set on foot investigations as to the prevalence and distribution of the disease and have formulated blanks for distribution. But desirable as this is, we need more than this. The important questions that we want to have answered, the facts that will help us in finding out more about the disease, are not to be settled by the routine investigation of epidemics.

These are to be found in literature by the dozen, and anyone familiar with the subject can tell you in advance just what such an investigation will show. The disease will be found in scattered foci, with cases radiating from these foci. It will reach its height in the late summer; it will follow the lines of travel; it will affect mostly children in the first dentition; the mortality rate will be from 3 to 15 per cent. In October the epidemic will begin to die out. Data of this class exist in abun-

9. New Orleans Times Democrat, April 27, 1911.

dance and are useful only in giving us the distribution of the disease in a given locality.

What we do need is a careful house-to-house study, made, if possible, during the epidemic by competent medical men on salary, giving their whole time to the work. These men should examine most carefully the premises, the neighborhood, and every detail of the patient's life, environment and habits, his points of contact with other cases, with sick animals, the history of wounds and insect bites, his food, antecedent illnesses, etc.

The solution of the mystery of this disease may come from the laboratory or from the field work, or from both, but field work to be of any use must be intensive. The collection of routine data will not settle the question of etiology.

Such a plan as this means financial support, and in Massachusetts we have found the legislature ready to give us such support, and not only the legislature, but the public, a voluntary subscription of \$3,000 from private sources having been placed at the disposal of an expert for the study of animal diseases akin to infantile paralysis. In addition to this the Massachusetts legislature of this year has appropriated \$10,000 for the use of the State Board of Health in the coming year in the study of the disease. These facts show how a community feels where the disease has prevailed extensively.

Finally, it would be of value if some bureau or central committee for the interchange of information could be established with regard to the disease in America and the provinces. Such data as are presented above are only secured now by the expenditure of much effort and a considerable amount of work and money. If the disease is to increase in the near future at the same rate as in the last two years in America, it is important for the medical profession to have at its disposal every facility for obtaining information and every opportunity for study of the disease that is possible. On the one side we run the risk of alarming the community by the publication of such facts as these, but on the other hand, if we neglect to look at the situation as it exists, we run the risk of being charged later with having underestimated the seriousness of the present situation.

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